

GP-Series 6 Graf/Pen™
Sonic Digitizers

The GP-Series 6 is a new family of sonic digitizers which eliminates data tablets and is designed to convert positional information conveniently and economically. This can be done in one, two, or three dimensions, producing digital values in a form suitable for display, data processing, storage, or transmission. The more sophisticated microprocessor-based models automatically perform mathematical computations previously requiring external processors or hand calculation. An L-frame sensor assembly borders the active work area, allowing interaction with a variety of images, such as CRT or plasma displays, projected images from x-rays and films, and maps or drawings on drafting tables. The unencumbered work area covered by movable or fixed sensors accommodates squares, triangles, and other drafting instruments.

Points on the plane to be digitized, which may measure up to 72" x 72", are located by stylus or cursor. The output is in Cartesian (X, Y) coordinates.

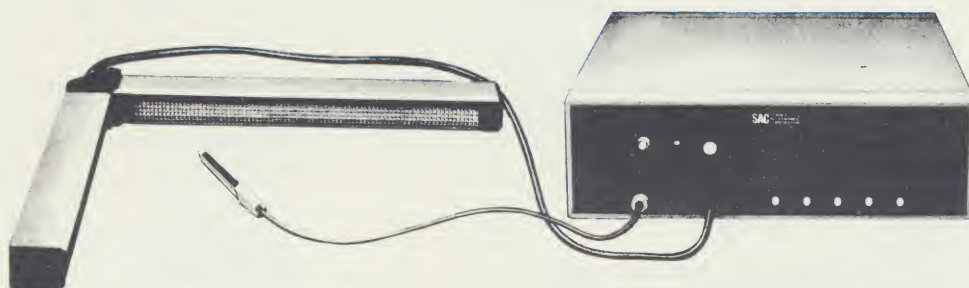
Five GP-Series 6 versions are offered, differing in features and processing capability:

- **Model 6-10** provides digital coordinates of any point on a plane. A parallel 14-bit binary output is standard.

- **Model 6-20** adds environmental temperature compensation to the Model 6-10.

Microprocessor Based Models

- **Model 6-30** incorporates all features of the models above plus a microprocessor and related firmware to provide origin offset (to arbitrarily establish an origin anywhere on a plane), incremental mode (to eliminate redundant data), and menu capability (to provide simultaneous alphanumeric data entry). This model is housed in a chassis which may be adapted for rack mounting or table-top installation. The output is in BCD Cartesian (X, Y) coordinates. Output is available compatible with RS-232 or IEEE 488-1975.



- **Model 6-40** utilizes additional firmware to add area (to calculate the area beneath or within a figure on a plane), line length (to calculate the length of traced lines), and variable scaling (to digitize 2 points and make derived scale selection by menu instruction). These features are selected from a special row of boxes at the bottom of the menu.

- **Model 6-50** adds axis rotation and slope calculation, and enables the user to work in polar as well as Cartesian coordinates.

In the Models 6-30, 6-40 and 6-50, the microprocessor's read-only memory can be reprogrammed for volumes, map coordinate transformations, and a wide variety of other user requirements. Model 6-50 allows extension into transcendental operations, such as complex coordinate transformations.

As required, SAC will analyze and consider other programs to be incorporated into programming libraries. The need for additional memory in which to store such user programs will vary from application to application; space is reserved within the unit for additional memory.

Three dimensional digitizing is available in Cartesian (X, Y, Z) coordinate form. An additional tablet using the same stylus or cursor allows inputs from two sources.

Various menu types are available with GP-Series 6 Models -30, -40, -50. The bottom line of the latter two provides blocks for individual program selection.

Stylus or Cursor

Either a stylus, or a cursor with cross hairs, or both may be supplied with GP-Series 6 systems to take data or to make menu selections. As easy to use as a ball point pen, the stylus contains both sonic energy generating gap and a ball point ink cartridge available in a choice of ink colors. Where hard copy is not required, an inkless cartridge may be used. A plastic, needle-point, non-scratching stylus for use with x-rays or CRT displays can be supplied in black or white for contrast with the background. A pushbutton controlled cursor may be substituted for the stylus. Three additional pushbutton switches can be provided on the cursor and, in the 6-30, -40, or -50, permit the user to control program selection.

Sensors

The free-standing GP-Series 6 electret microphone sensors require no tablet and provide a transparent, unencumbered work area. The design of the sensor permits mounting on a variety of display surfaces. SAC also offers standard GP-Series 6 tablets with sensors pre-mounted on clear acrylic for use with light tables, on frosted acrylic on which graphic information can be rear-projected, or on a phenolic (e.g. Formica) surface.

[illegible]

Specifications

Resolution: 0.1mm.
Tablet: Clear, frosted, or opaque available. When a tablet is specified, origin point will be marked in upper left hand corner.

Cursor: When a cursor is specified, one button operation is standard. Three extra function buttons are optional.

Active Area: System will digitize in areas up to 72" x 72" with stylus or cursor, depending upon the active area specified.

Reproducibility: 0.1% of the distance from the point digitized to the sensors or \pm least significant bit, whichever is greater.

Digitizing Rate: Up to 140 points per sec.

Ambient Temperature Range: 18°-28°C.

Ambient Humidity Range: 0-90%, non-condensing.

Ambient Noise: In normal office and industrial environments, no deleterious effect.

MODELS 6-10 and 6-20 ONLY

Physical Dimensions: Height: 5"
 Width: 6½"
 Depth: 6"
 Weight: 2 lbs.

Power Requirements: +5 vdc \pm 5%, 1.1 amp max. ripple 100 mv. 6-20 only \pm 12 vdc \pm 5%, 50 ma max. ripple 100 mv. Power supply

Option: MODELS 6-30, -40, and -50 ONLY

Physical Dimensions: Height: 5¼"
 Width: 17½"
 Depth: 12"
 Weight: 35 lbs.

Power Requirements: 110/220 VAC, 50-60 Hz. 120 VA.

Front Panel: Connector for stylus or cursor.
 Power on-off.
 Sensor connector.
 POINT/LINE switch.
 RATE control.
 CLEAR button.
 START button.
 ORIGIN button with light.
 INCREment button with light, alternate action on and off.
 MENU button with light, alternate action on and off.
 ENGLISH/METRIC switch behind front panel.

Connectors: Front Panel: For stylus or cursor, and sensor input.
 Back Panel: Auxiliary sensor input connector, data output connector.

Options: RS-232 output.
 IEEE 488-1975 output.
 Rack mount.
 Display.

Main Programs: Model 6-30: X-Y, origin, increment, menu, output.
 Model 6-40: Add area, line length, scaling.
 Model 6-50: Add axis rotation, slope calculation, polar coordinate transformation.

Increment: All digitizings are compared with previous digitizings. If the incremental difference is not more than two counts (total \pm 0.02" or 0.02 mm), no new output is produced. If the incremental difference is three or greater, update and new output is given.

Origin: When turned on, an origin may be sought through repeated digitizings in either point or line mode. Once the desired origin is reached, pushing the START button locks this origin into memory and all subsequent digitizations are output or displayed relative to this point. The origin may be eliminated by pressing CLEAR.

Menu: Switchable on and off. Outputs ASCII character equivalent of selected item. Two decimal points are displayed when a menu character is selected. Standard is four lines of alphanumeric characters. Two lines of standard ASCII control characters and/or one line of program select boxes can be added. Also, the menu can call up to eight special programs. Menu is in lower right hand corner of active area. In a two tablet system, the menu may be on one tablet with the work on the other.

Output: (Option for 6-30, -40, and -50) RS-232: Two switchable outputs on rear panel for Terminal and Modem. Standard baud rate is 1200 baud. Options are: 110, 150, 225, 300, 450, 600, 900, 1200, 1800, 2400, 3600, 4800, 7200, 9600. IEEE 488-1975: One output on rear panel.

Polar Coordinates: When selected, after an origin has been chosen and an abscissa defined, all outputs will be in terms

of Rho, Theta (decimal radians).

Area: With the menu turned on, the area program can be selected by pointing to the labeled location on the menu. A contour may be traced and the area under the curve will be calculated and displayed by depressing the START button. The area calculation automatically closes from end point to start point. The calculated area may be output by pointing to the output box in the menu. The menu may be left on or off during the area digitizing.

Line Length: With menu turned on, the length program can be selected by pointing to the labeled location on the menu. A curve may be traced and the length of the last segment will be displayed on the left of the display, with the accumulated length on the right. A new length can be started by outputting the accumulated length or by pressing the START button.

Scaling: The GP-Series 6 initially outputs in metric (centimeter) or English (inch) units, depending on switch selection. If an arbitrary scale is desired, the scale box may be pointed to with the menu turned on. In the point mode, two points are selected as the desired length from the input document. Then an integer or set of integers may be selected from the menu. Once START is depressed, all further digitizations will be in units corresponding to the ratio of the integers to the length between the two points.

Axis Rotation: When selected, two points of the abscissa of the input information may be chosen. After START is depressed, subsequent operations will be in terms of the rotated coordinated system. Angular accuracy is \pm 10 minutes.

Slope: Function is selected from the menu. After selection, two points on a curve may be digitized and the slope of the line will be calculated. If an axis rotation has been made, the slope will be calculated with respect to the rotated axis.

SAC's sonic digitizing process is covered by U.S. Patent No. 3626483 and No. 3821419. Other patents pending.

Printed in U.S.A.



**SCIENCE
ACCESSORIES
CORPORATION**

970 Kings Highway West, Southport, Connecticut 06490
 (203) 255-1526 Telex 964300